

## ERGONOMIC CONTROL PANEL FOR A PORTABLE ELECTRIC GENERATOR

### FIELD OF THE INVENTION

**[0001]** The present invention relates to control panels for devices such as portable electric generators, and more particularly to an ergonomic control panel for a portable electric generator.

### BACKGROUND OF THE INVENTION

**[0002]** Portable electric generators are used in a wide variety of applications. Such applications include use at construction sites for powering various electric power tools such as drills, saws, lights, electric heaters, etc., as well as in residential applications for providing a back-up source of electric power in the event of a power outage. Such portable electric generators typically have a control panel with a plurality of electrical outlets and switches for selecting certain outlets thereof for use. For example, generators which provide either 120VAC or 240VAC use a switch by which the user selects either 120VAC or 240 VAC operation. Circuit breakers are also often included at various locations on the control panel.

**[0003]** Typically the above-described outlets, breakers and switches are not logically organized on the generator control panel. This can lead to considerable confusion on the part of the user in the event the user is in a hurry to plug a power cord into one of the outlets of the generator or if lighting

conditions are not acceptable, leading to difficulty in the operator seeing the switches, outlets or breakers that the user needs to access.

**[0004]** Accordingly, it would be highly beneficial to provide a control panel for a portable electric generator that logically groups the various switches, outlets and circuit breakers used to control operation of the generator into different areas or “zones”. More specifically, it would be highly advantageous to provide a plurality of distinct zones on the control panel wherein the various outlets, breakers and switches of the generator are grouped within each zone in a fashion that significantly eases the use of the generator and reduces the possibility of operator error in selecting outlets, switches or breakers.

#### SUMMARY OF THE INVENTION

**[0005]** The present invention relates to a control panel for a portable electric generator. The control panel is segmented into a plurality of distinct regions or “zones”. Each zone includes logically related and organized components to minimize the possibility of the operator accidentally selecting the wrong control or mistakingly trying to engage the plug of a power extension cord with an improper (i.e., non-mating) electrical outlet of the generator.

**[0006]** In a preferred embodiment, an ON/OFF engine switch is included in the first zone. A plurality of electrical receptacles are included within a second zone disposed adjacent to the first zone. A third zone includes a control for controlling the internal combustion engine of the generator.

**[0007]** In one preferred embodiment the first zone also comprises a circuit breaker switch. The circuit breaker switch and the ON/OFF engine switch are further disposed at longitudinally opposite ends of the first zone to reduce the possibility of the operator mistakingly engaging one of these switches when the operator intended to engage the other one of the switches.

**[0008]** The second zone includes at least one, and more preferably a plurality, of electrical outlets for supplying a first voltage, and at least one outlet for supplying a second voltage. In one preferred form the first outlets provide 120VAC and the second outlet provides 240VAC. The 240VAC outlet is further disposed at a longitudinally opposite end of the second zone from the first outlets to minimize the possibility of the operator mistakingly trying to plug in a power cord plug into the wrong outlet. The 240 VAC outlet is further separated from the 120VAC outlets by a voltage selector switch for selecting either 120VAC or 240VAC operation. A plurality of thermal circuit breakers are further disposed closely adjacent each of the outlets to provide a clear indication when the current being drawn by a given outlet has exceeded a maximum predetermined level, thus "tripping" the breaker.

**[0009]** In the preferred embodiments, each of the zones are further laid out as horizontally disposed, rectangular zones positioned adjacent one another. Optionally, one or more longitudinal frame members of a frame of the generator may be used to demarcate the zones from one another. The frame members also provide protection from accidental damage to electrical components on the control panel.

[0010] Further areas of applicability of the present invention will become apparent from the detailed description provided hereinafter. It should be understood that the detailed description and specific examples, while indicating the preferred embodiment of the invention, are intended for purposes of illustration only and are not intended to limit the scope of the invention.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The present invention will become more fully understood from the detailed description and the accompanying drawing, wherein:

[0012] Figure 1 is a perspective view of a generator incorporating a control panel in accordance with a preferred embodiment of the present invention;

[0013] Figure 2 is an enlarged view of just the control panel and a portion of the generator frame; and

[0014] Figure 3 is an end view of a portion of the generator.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] Referring to Figure 1, there is shown a control panel 10 used with a portable electric generator 12. The generator 12 includes a frame 14 for supporting an internal combustion engine 16. An electric generator (hidden from view) is coupled to an output shaft of the engine 16.

[0016] Referring to Figure 2, the control panel 10 is shown in greater detail. The control panel 10 includes a plurality of switches and electrical

receptacles which are logically and ergonomically arranged to provide significantly increased ease of use of the generator 12. To this end, the control panel 10 is divided into a plurality of distinct regions or "zones" 18, 20 and 22. The frame 14 further includes tubular frame members 14a, 14b and 14c which are disposed generally parallel to one another, and which further help to demarcate the three distinct zones 18, 20 and 22 of the control panel 10 and to protect the components on the control panel from damage due to accidental contact with other tools or objects. Each zone 18, 20 and 22 comprises a horizontally laid out, generally rectangular area, and each of the zones are arranged parallel to one another. The uppermost zone 18 includes an ON/OFF engine switch 24 at one longitudinal end of the zone 18 and a main circuit breaker switch 26 at the opposite longitudinal end of the zone. The switches 24 and 26 are further separated by an indicia member or area 28 in which a company name or other indicia identifying the manufacturer of the generator 12 may be included. The first zone 18 of the control panel 10 is further formed so as to be inclined slightly relative to the other zones 20 and 22, as indicated in Figure 3, to present slightly easier access to the switches 24 and 26. Each of the switches 24 and 26 are illustrated as rocker style switches, but it will be appreciated that push button switches, slide style switches, toggle style switches or virtually any other form of switch could easily be incorporated in lieu of rocker style switches.

**[0017]** The second zone 20 is also configured as an elongated, rectangular region. The second zone 20 includes a plurality of electrical

receptacles or outlets 30, 32, 34 and 36 arranged within a first subregion 20a. Outlets 30 and 36 comprise conventional twist lock receptacles for use with mating male twist lock electrical plugs. Outlets 30 and 36 preferably are capable of supplying 20 to 30 amps of current. Electrical outlets 32 and 34 are ground fault interrupter (GFI) electrical outlets which each supply 120VAC and preferably up to 20 amps of current or more.

**[0018]** Thermal circuit breakers 38, 40, 42 and 44 are each associated with a respective one of the outlets 30-36. Advantageously, each thermal breaker 38-44 is disposed closely adjacent the electrical receptacle 30-36 with which it is associated. Thus, thermal breaker 38 is associated with outlet 30, thermal breaker 40 is associated with outlet 32, thermal breaker 42 is associated with outlet 34 and thermal breaker 44 is associated with outlet 36.

**[0019]** With further reference to Figure 2, a voltage selector switch 46 is disposed within a second subregion 20b of region 20 while a 120/240VAC electrical outlet 48 is disposed within a third subzone 20c of zone 20. The voltage selector switch 46 in one preferred form comprises a rocker style switch which is laid out horizontally. Indicia 46a to the left of switch 46 indicates to the user that depressing the left side of the switch selects the outlets 30-36 for maximum 120VAC power. Pressing the right side of switch 46 selects outlet 48 for 240VAC operation. The placement of the switch 46 inbetween the group of outlets 30-36 and outlet 48, along with its horizontal positioning, helps to ensure that the operator realizes which electrical receptacles are being selected for use. By requiring the operator to push the left side of the switch 46 if one or more of

the electrical outlets 30-36 are to be used, or to depress the right side of the switch 46 if outlet 48 is to be used, there is a further degree of logical control introduced into the selection of which outlets 30-36 and 48 the operator is selecting for use.

**[0020]** Another advantage to the above-described layout is that the 120/240VAC electrical outlet 48 is disposed at the longitudinally opposite end of the zone 20b from the 120VAC electrical outlets 30-36. This further helps to reduce the possibility that the operator may inadvertently attempt to plug a 120VAC electrical plug into the 120/240VAC outlet 48.

**[0021]** The third zone 22 includes an "Idle Control" on/off switch 52. This switch is typically used less frequently than switches 24, 26 or 46, and is therefore disposed at the lowermost area of the control panel 10. Switches 24 and 26, being much more commonly used, are disposed in the first zone 18. The auto throttle on/off switch 52 is used to choose whether or not the gas engine 16 will run at one constant speed, or throttle up and throttle down automatically depending on current draw on the generator 12.

**[0022]** From the foregoing, then, it will be appreciated that the control panel 10 of the present invention provides the switches, electrical outlets and circuit breakers typically used with a portable electric generator in a highly logically organized arrangement. The arrangement of the control panel 10 into distinct zones further significantly reduces the possibility of the user unintentionally attempting to engage the wrong electrical outlet with a given electrical plug. The placement of the various control switches also significantly

improves the convenience of use of the control panel 10 by locating those switches which are accessed most frequently at the upper area of the control panel, while switches which are accessed less frequently are disposed at lower locations on the control panel. The generally central placement of the voltage selector switch 46 further helps to ensure that the operator will not accidentally select the wrong electrical outlet for use.

**[0023]** Those skilled in the art can now appreciate from the foregoing description that the broad teachings of the present invention can be implemented in a variety of forms. Therefore, while this invention has been described in connection with particular examples thereof, the true scope of the invention should not be so limited since other modifications will become apparent to the skilled practitioner upon a study of the drawings, specification and following claims.